PROPOSAL FOR RECCONNAISSANCE EXPLORATION (G-4 STAGE) FOR COAL

WEST OF GHUGUS AND BELLORA

NMET FUNDED PROJECT

WARDHA VALLEY COALFIELD

DISTRICT– YAVATMAL, MAHARASHTRA

सेन्ट्रल माईन प्लानिंग एण्ड डिजाइन इन्स्टीच्यूट लिमिटेड
(कोल इण्डिया लिमिटेड की अनुषंगी कम्पनी / भारत सरकार का एक लोक उपक्रम)
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JUNE- 2022

PROPOSAL FOR RECCONNAISSANCE EXPLORATION FOR COAL (G-4 STAGE) IN WEST OF GHUGUS AND BELLORA BLOCK, WARDHA VALLEY COALFIELD DISTRICT-YAVATMAL, MAHARASHTRA

1.0 INTRODUCTION

1.1 Wardha Valley Coalfield has assumed importance by virtue of its location to meet the increasing coal demand in southern and western part of the country. Wardha Valley Coalfield covers an area of about 4130 sq.kms. Within the districts of Chandrapur and Yeotmal in Maharashtra State. The likely extension of this coalfield due NNW in the Wardha district below the Deccan Traps cannot be ruled out. Furthermore, the Godavari Valley Coalfield in SSE may be the likely extension of Wardha Valley Coalfield in the Adilabad district of Telangana. The block proposed in the present area forms part of western limb of the plunging anticline in the southwestern part of Wardha Valley Coalfield. The possible occurrence of coal in the block is located in dip side of Ghugus(Rationalized) block.

1.2 Wardha Valley Coalfield is located in the south-eastern part of Maharashtra State and is bounded between Latitude N 19^0 30' & N 20^0 27' and Longitude E $78^0$50' & E $79^0$49'.

1.3 As per the available data, no borehole was drilled in West of Ghugus and Bellora block. Based on occurrence of Coal in Ghugus and Bellora block in Northern part of the area under study , G-4 level exploration is proposed for Coal exploration in West of Ghugus and Bellora block which falls in down dip direction of Ghugus and Bellora block Respectively.

1.4 West of Ghugus and Bellora is located in the South western part of Wardha valley CF, District Chandrapur. The area is covered in the toposheet 56 M/3. The area falls in the Chandrapur district of Maharashtra state.

1.5 Accordingly CMPDI has drawn proposal for exploration for coal in West of Ghugus Block involving **3500 m** of drilling in **6**boreholes for G4 stage of exploration. The boreholes have been proposed approximately at 3200m×3200m grid.

2.0 OBJECTIVES

2.1 The G4 stage of Exploration in the block is proposed to fulfill following objectives-

1. To establish the existence and continuity of coal seams occurring in the block as significant coal resources are present in adjoining block such as Ghugus and Bellora block etc.
2. To establish the lay, disposition and potentiality of coal seams.
3. To assess the coal resource by G4 stage of exploration in the block

3.0 LOCATION, COMMUNICATION AND ACCESSIBILITY

3.1 The area falls in the Yavatmal district of Maharashtra state The Ghugus Township is located at a distance of about 4 kms from this block and is connected by a fair weather Chandrapur-Wani road. From Nagpur, the block is at a distance of 160 Kms. The nearest railway station is at Ghugus branch of Central Railway.

3.2 West of Ghugus and Bellora is located in the south western part of Wardha valley CF District Chandrapur. The area is covered in the toposheet 56 M/3.

4.0 PHYSIOGRAPHY, DRAINAGE

4.1 The area is almost entirely covered by Black cotton soil. Nirduda nala is flowing through the block from North West to South east direction. As per the Survey of India Topo sheet, around 5.80 Sq.kms area of Pardi Reserve Forest falls within the West of Ghugus and Bellora Block.

5.0 CLIMATE AND VEGETATION

5.1 The area experiences typical tropical climate. The summer season is from April to June with the maximum temperature reaching up to 48^0 C during May. Winters are moderate with the minimum temperature dropping up to 8^0 C. Monsoon generally extends from June to September. The average annual rainfall is around 1000 mm. The major precipitation is experienced between July and September.

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5.2 The area under study is partly forested however occurrence of Thick forests and dense Jungles are found in the area. Out of the Total area 39.15 Sq. km (approx.) under exploration 15.85 Sq. km is Forest area and 23.30 Sq. km Non Forest Area.

6.0 BROAD GEOLOGICAL SET UP

6.1 Stratigraphic Sequence

The geological succession in this basin as per published report of GSI, CMPDI and MECL in the study area are as given below

TABLE-II

STRATIGRAPHIC SUCCESSION OF THE COALFIELD

Age	Formation	Lithology
Recent/Sub-Recent	Detrital Mantle	Black cotton soil/sandy soil
Upper Cretaceous	Deccan Trap	Basalts
----------UNCONFORMITY----------		
Cretaceous	Lameta	Cherty limestone, chert, brown, yellowish to pale white silicified sandstones, claystone.
----------UNCONFORMITY----------		

Age	Formation	Lithology
Upper Permian to Lower Triassic	Kamthi	Red, brown and variegated clays, ferruginous coarse grained sandstone and shale bands.
----------UNCONFORMITY----------		
Middle Permian	Motur	Medium to fine grained variegated sandstones, variegated clays and shales.
Lower Permian	Barakar	Light grey to whitish sandstones with grey shale, sandy shale, alternate bands of shale and sandstone and coal seams.
Upper Carboniferous to Lower Permian	Talchir	Greenish to grey sandstones, siltstone and shale.
----------UNCONFORMITY----------		
Pre-Cambrian	Vindhyan	Greenish to grey quartzitic sandstone, pinkish limestone and chert.
----------UNCONFORMITY----------		
Archaeans	Metamorphics	Quartzites, granites, gneisses and schist etc.

7.0 Geology of the block

7.1 On the basis of Surface and Subsurface data of exploratory boreholes drilled by GSI/CMPDI/MECL in Ghugus and bellora Block, the generalized tentative sequence of the different formations in the area under study is given below in Table III.

TABLE-III

Age	Formation	Lithology
Recent To Sub recent	Soil	Sandy and black clayey soil.
Upper Permian to Lower Triassic	Kamthi	Yellow, brown, red, yellowish white ferruginous fine to coarse grained sandstone and pinkish yellow gritty sandstone with yellow, brown, variegated calys.
Middle Permian	Motor	Green to greenish grey white, medium to coarse grained sand stone with green and variegated clays.
Lower Permian	Barakar	Upper Barakar : generally greyish/white medium to coarse grained sandstone with occasional green sandstone and dis-semented granets. At places interbedded with shale, carb-sahle and thin bands of coal and pyrite. Coal Seam : Thick composite coal seam with two well defined split sections Top split and Bottom split with shale, sandstone and ICAL as parting Lower Barakar : generally fine to medium grained, garnetiferous sandstone, shale with thin coal bands.

8.0 Regional Structure

8.1 As per the geological structure of Ghugus and Bellora block, tentative general attitude of the bedding in the West of Ghugus and Bellora is NNW with dipping towards WWS. However, the amount of dip and change in direction cannot be ruled out due to occurrence of large faults.

8.2 The interpretation of geological structure in West of Ghugus and Bellora block is solely based on the sub-surface data obtained from the boreholes drilled in Ghugus and Bellora block coupled with regional structure interpreted in adjacent Mungoli Nirguda blocks.

8.3 Based on the data obtained from boreholes drilled in adjacent blocks by MECL, GSI and CMPDI and regional structure in Blocks, tentative floor contour plans have been attempted to decipher the geological structure of West of Ghugus Block.

8.4 It is observed from the floor contour plans that the general strike of the beds trends NNW with dipping towards WWS.

8.5 The geological structure deciphered in the block is highly tentative in nature and occurrence of additional Fault in the area under investigation cannot be ruled out completely which may increase or decrease the depths of the boreholes

9.0 Sequence and quality of coal seams:

9.1 The Wardha Valley Coalfield is characterized by the presence of one thick Coal Seam varying in thickness from 15 m to 20 m that splits into two or three sections as Top & Bottom or Top, Middle & Bottom. These creatable sections are separated by well-defined parting.

9.2 The detailed exploration in the adjoining blocks, i.e Ghugus and Mungloi Nirguda blocks, reveals mainly one composite seam that splits into Top Upper split, Top combined, Middle and Bottom section

Brief of the same is given below.

Thickness range based on Ghugus-Nakoda/Mugoli Nirguda Comb. Block Located in the Northen Part of the Block

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Seam	Thickness range	
	min	max
Top upper split	0.23	2.44
Top combined	0.44	4.34
Middle section	1.02	4.28
Bottom Section	6.53	11.07

The overall grade

in the proposed block varies from **G9-G13.**

10. EXPLORATION SCHEME

10.1 **Drilling:**

Drilling of **3500 m** in **6** boreholes has been proposed in 3200x3200 m grid for the West of Ghugus and Bellora Block. The depth of intersection for Composite seam has been proposed from 500 m to 750 m at minimum to maximum range. (Table IV)

TABLE IV

Depth of Proposed Boreholes in West of Ghugus block, Wardha valley Coalfield

ANNEXURE I

APPROXIMATE METERAGE OF PROPOSED BOREHOLE POINTS IN WEST OF GHUGUS BLOCK, WARDHA VALLEY COALFIELD

S. NO.	P. POINT NO	TENTATIVE R.L.	TENTATIVE F.R.L.	APPROXIMATE DEPTH	REMARKS
1	P-1	200.00	-330.00	530	
2	P-2	200.00	-520.00	750	
3	P-3	200.00	-400.00	600	
4	P-4	200.00	-300.00	500	
5	P-5	200.00	-400.00	600	
6	P-6	200.00	-320.00	520	
Grand Total		**6 Boreholes**		**3500.00**	

Note: Meterage of proposed boreholes may also vary due to, surface R.L., change in trend and throw amount of faults if any. Existence of faults cannot be ruled out.

One boreholes may be extended beyond 700m for establishing the complete strati graphical sequence in the region.

In view of soft and friable nature of Motur clays and sandstone which causes problem in the drilling appropriate technology, combination of drilling method be adopted to complete the project in the time schedule.

10.2 **Geophysical Investigation:**

All the boreholes will be geophysical logged. The parameters involved are Sonic, Dual density, Natural Gamma, caliper, SPR, deviation, etc.

10.3 **Laboratory Studies**: Band by Band Analysis, overall analysis, special tests, & Geotechnical studies will be carried out on coal samples.

10.4 Quantum of Work Proposed: Details of proposed work for detailed exploration for coal in West of Ghugus block is given below in Table-V

TABLE-V

QUANTUM OF WORK

S.No.	Activity	Quantity
1.	Geological Mapping	39.15 Sq km
2.	Drilling:	
	i) Boreholes	6 BHs.
	ii) Meterage	3500 m
3.	i) Levelling and Triangulation	As per requirement
	ii) DGPS survey of Boundary and boundary points	6 BHs. And cardinal points of blocks
4.	Drill Core Logging	3500 m
5.	Geophysical Logging	6 boreholes 3500 m
7	Chemical Analysis:	
8	Band by Band	
a	Ash+ Moisture	350samples
b	House keeping	350samples
9	Overall	
a	Proximate analysis	40 -Samples
b	Moisture at 60%RH and 40^0C	40 -Samples
c	GCV	40 -Samples
d	Sample Preparation and house keeping	40-Samples
8	Special Tests	1 Borehole
9	Petrographic Analysis	1 Borehole

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11.0 LIMITATIONS

11.1 Out of the Total area 39.15 Sq km (approx.) under exploration 15.85 Sq. km (approx.41%) is Forest area and remaining 23.20Sq. km (approx. 59%) Non Forest Area.

11.2 Some of the boreholes may require shifting due to non-approachability due to gullies / villages/ forest cover etc geological structure etc.

11.3 As the proposed meterage is based on the tentative structure as per Regional reports and data of adjoining blocks, actual meterage may vary during course

12.0 LIST OF PLATES

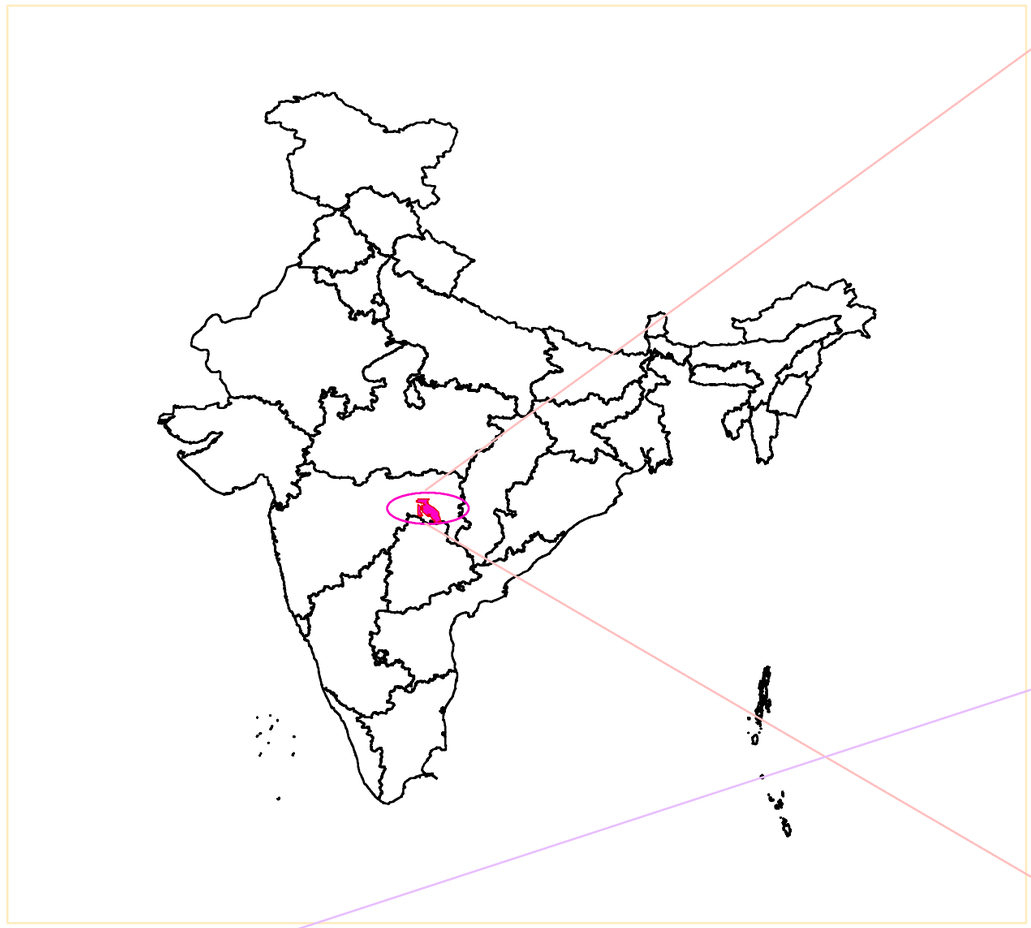
12.1 Following plates are enclosed with the proposal:

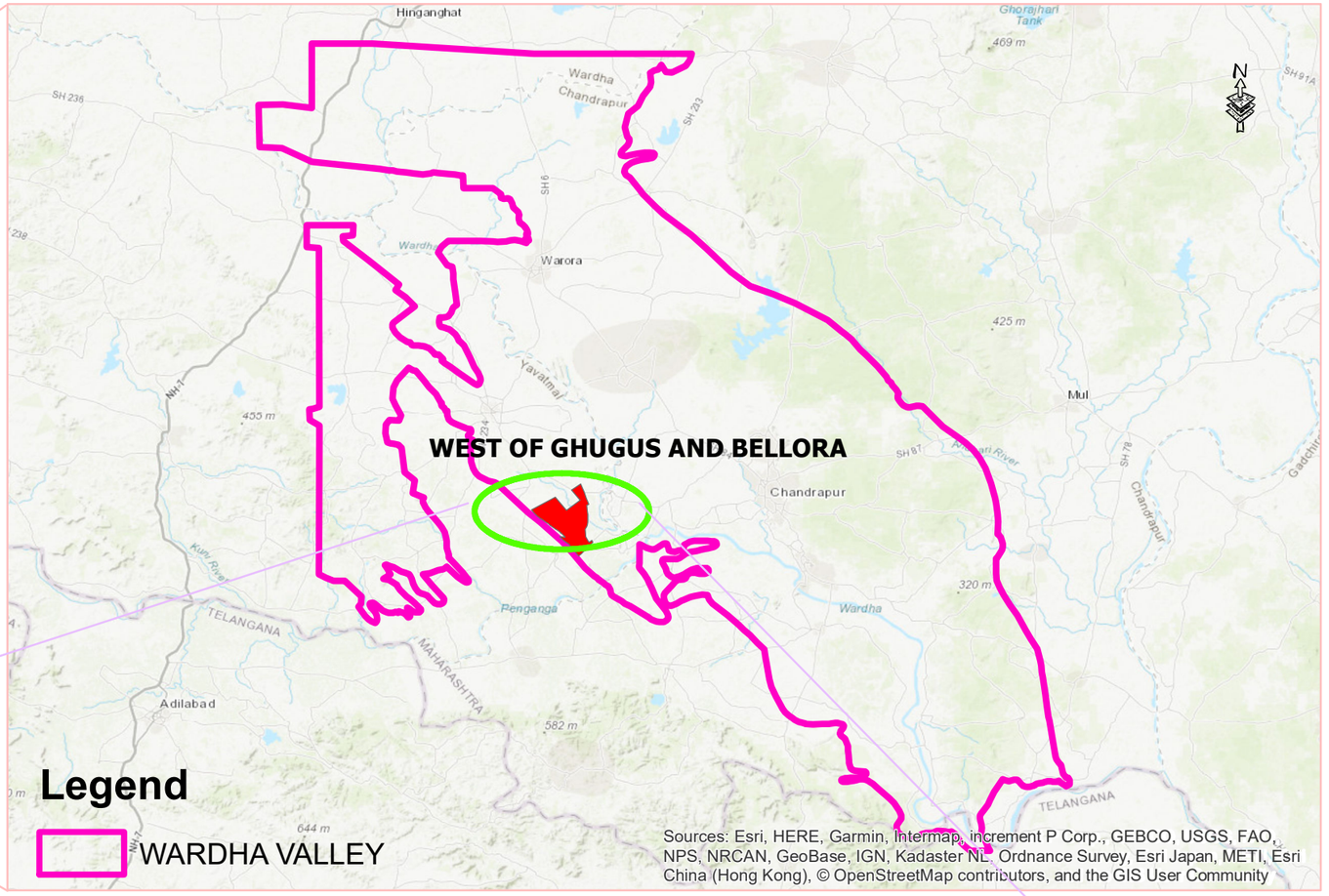
I. Block Location Map

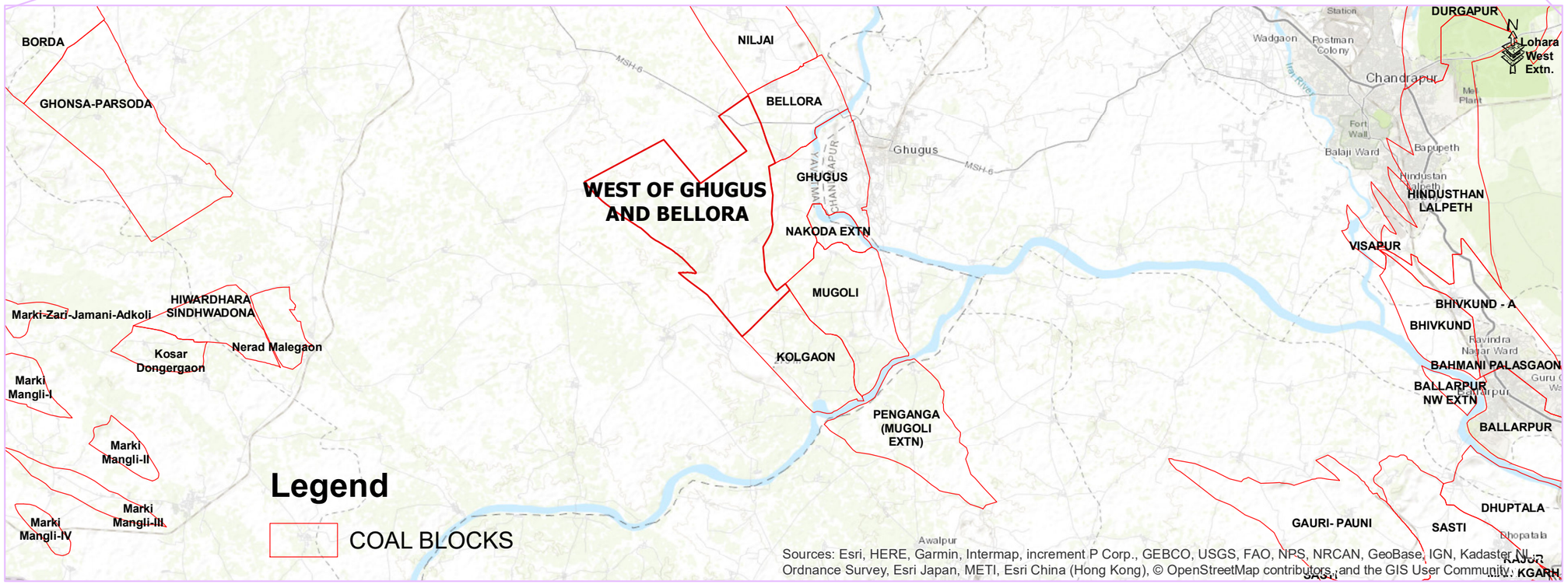
II. Borehole Location Plan on RF 1:10,000 along with Floor contour plan (tentative) of Composite Seam in West of Ghugus Block, Wardha valley CF coalfield.

III. Graphic logs of boreholes drilled by CMPDI.

LOCATION MAP WEST OF GHUGUS AND BELLORA BLOCK,WARDHA VALLEY COALFIELD,MH, INDIA







ALL MAPS NOT TO SCALE

79°0'0"E
79°2'30"E
79°5'0"E
79°7'30"E
19°57'30"N
19°55'0"N
19°52'30"N

NILJAI
BELLORA
GHUGUS
WEST OF GHUGHUS AND BELLORA
NAKODA EXTN
MUGOLI
KOLGAON

N

0 500 1,000 2,000 3,000 4,000
Meters
1:50,000

GEOLOGICAL MAP OF A PART OF WARDHA VALLEY COALFIELD,MAHARSHTRA

(SOURCE : BHUKOSH(GSI)

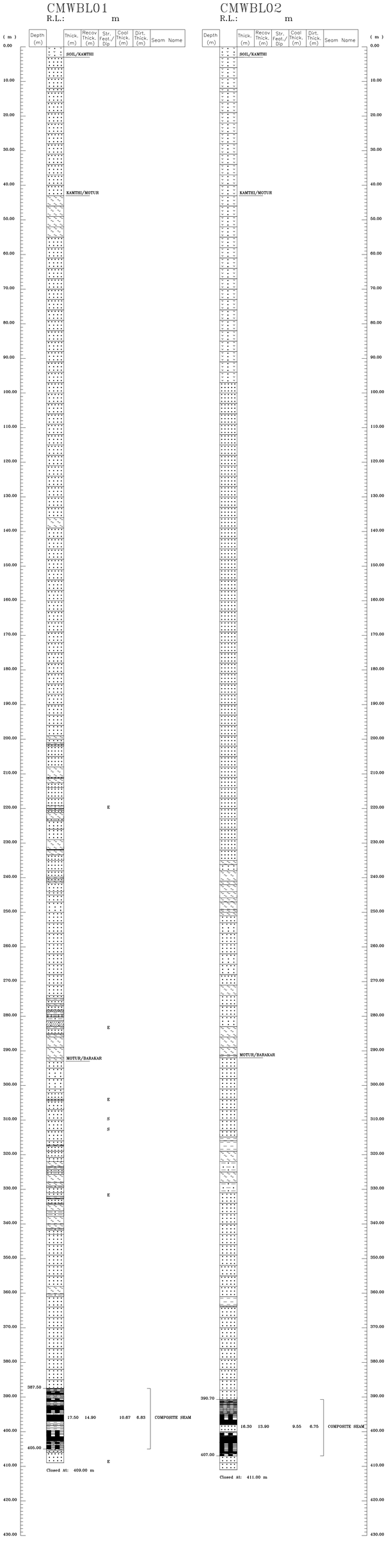
Legend

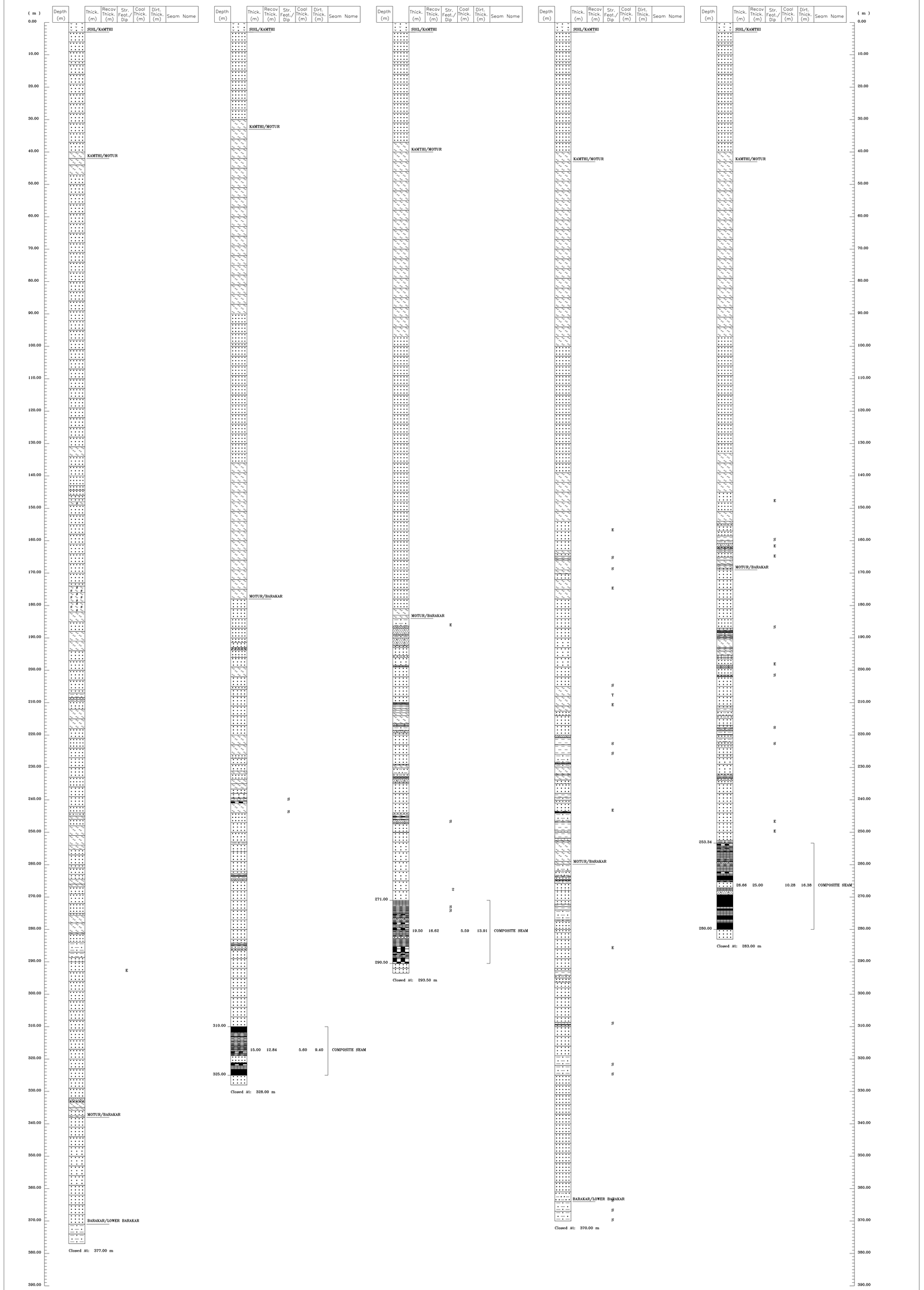
Block_Boundary
Fault

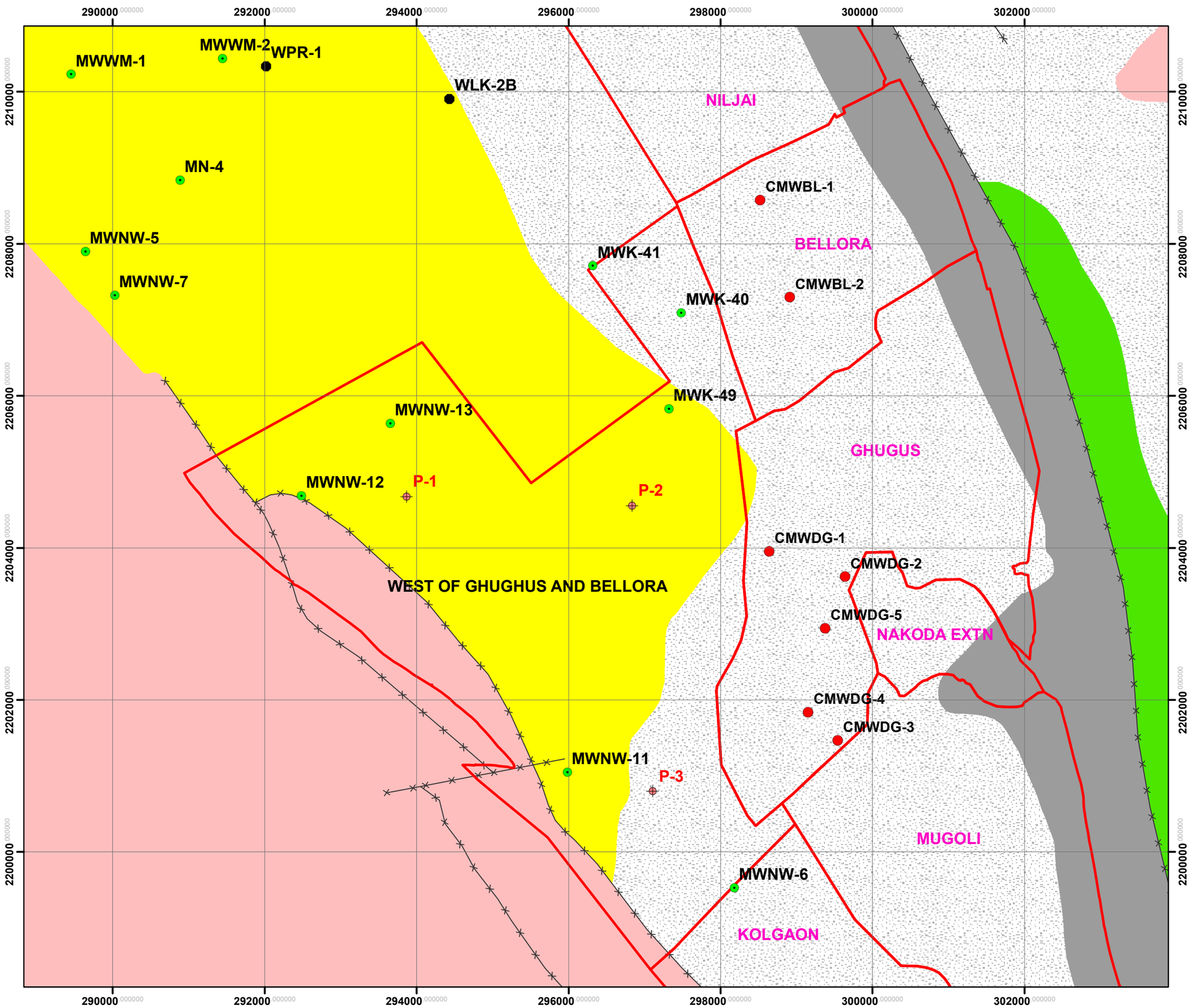
Lithology

FORMATION

ALLUVIUM
KAMTHI
BARAKAR
TALCHIR
PROTEROZOICS


CMWBL01
R.L.: m
CMWBL02
R.L.: m
(m)
Depth (m)
Thick. (m)
Recov Thick. (m)
Str. Feat./ Dip
Coal Thick. (m)
Dirt. Thick. (m)
Seam Name
SOIL/KAMTHI
KAMTHI/MOTUR
MOTUR/BARAKAR
387.50
17.50 14.90 10.67 6.83 COMPOSITE SEAM
405.00
Closed At: 409.00 m
390.70
16.30 13.90 9.55 6.75 COMPOSITE SEAM
407.00
Closed At: 411.00 m


CMWDG01
R.L.: m
CMWDG02
R.L.: m
CMWDG03
R.L.: m
CMWDG04
R.L.: m
CMWDG05
R.L.: m
SOIL/KAMTHI
KAMTHI/MOTUR
MOTUR/BARAKAR
271.00
19.50 16.62 5.59 13.91 COMPOSITE SEAM
290.50
Closed At: 293.50 m
310.00
15.00 12.84 5.60 9.40 COMPOSITE SEAM
325.00
Closed At: 328.00 m
BARAKAR/LOWER BARAKAR
Closed At: 377.00 m
Closed At: 370.00 m
253.34
26.66 25.00 10.28 16.38 COMPOSITE SEAM
280.00
Closed At: 283.00 m



N

0 500 1,000 2,000 3,000 4,000

Meters

1:50,000

Proposed Borehole Location Plan, West of Belora & Gugus Block Wardha Valley CF

Legend

- CMPDI_BHS
- GSI_BHS_G4
- MECL_BHs
- Proposed BH_Revised
- Block_Boundary
- Fault

Lithology

FORMATION

- ALLUVIUM
- KAMTHI
- BARAKAR
- TALCHIR
- PROTEROZOICS

Project Cost Estimate for Reconnaisance Survey (G4 Stage) in West of Ghughus Block, Wardha Valley Coalfield

Sl. No	Item Work	Item no in Soc	Unit	Rates as per SoC of NMET	Rate (Rs)	Qty.	Amount (Rs)
	I- Field operations (Outsourcing)						
A	**DRILLING**						
1	Drilling (As per MoC Rate 2020-21)	2.2.1.1b	m	6775	6775	2500	16937500
B	**GEOPHYSICAL STUDIES**						
1	Borehole Geophysical logging (As per MoC Rate 2020-21)	3.11	m	470	566	2500	1415000
	Field operations Total (A+B)						**18352500**
	II- Field Work (In House)						
A	**GEOLOGICAL WORK**						
1	Survey Work -1 Surveyor	1.6.1a	Day	8300	8300	30	249000
2a	Geological Party days-Field - 1 Geologist	1.5.1b	Day	11000	11000	120	1320000
2b	Geological Party days-HQ (Data processing & Report Preparation)-1 Geologist	1.5.1b	Day	9000	9000	30	270000
	Sub Total A						**1839000**
B	**GEOPHYSICAL STUDIES**						
3a	Geophysict Party days-Field (Field Work) - 1 Geologist	3.19	Day	11000	11000	5	55000
3b	Geophysicst Party days-HQ (Data processing & Report Preparation)-- 1 Geologist	3.19	Day	9000	9000	7	63000
	Sub Total B						**118000**
	Field Work Total (A+B)						**1957000**
	III-Laboratory Studies (In House)						
1	***Band By Band Analysis***						
a	Ash+Moisture	4.2.6	per sample	700	700	180	126000
b	House Keeping	4.2.1	per sample	115	115	180	20700
c	Sample preparation for Band by Band Analysis	4.2.2	per sample	500	500	180	90000
2	***Overall analysis***						
a	Proximate analysis	4.2.7	per sample	935	935	25	23375
b	Moisture at 60% RH & 40C	4.2.8	per sample	1010	1010	25	25250
c	GCV	4.2.11	per sample	1505	1505	25	37625
d	Sample preparation & House Keeping	4.2.3	per sample	795	795	25	19875
3	***Special Test***						
a	Ultimate analysis	4.2.17	per sample	9945	9945	5	49725
b	Total Sulphur	4.2.14	per sample	1900	1900	5	9500
c	Distribution of Sulpher	4.2.15	per sample	3695	3695	5	18475
d	HGI including sample preparation	4.2.18	per sample	3805	3805	5	19025
e	AFT (Ash Fusion Temperature)	4.2.20	per sample	2745	2745	5	13725
f	Ash analysis	4.2.25	per sample	13644	13644	5	68220
4	**Petrographic analysis**						
a	Pellet preparation	4.3.14a	per sample	1160	1160	5	5800
b	Maceral Analysis (with photomicrography)	4.3.14e	per sample	25000	25000	5	125000
c	Microlithotype Analysis (with photomicrography)	4.3.14g	per sample	25000	25000	5	125000
d	Mean Ro%	4.3.14j	per sample	16345	16345	5	81725
	Laboratory Studies Total						**859020**
	IV. Miscellaneous Charges (In House)						
a	Preparation of Exploration Proposal	5.1	lump sum	380000	380000		380000
b	Outsourcing process cost (2% of approved project cost or 5 Lakh, whichever is lower)	2.3	lump sum	500000	500000		500000
c	Operational charges for CMPDI	Point 3 of SOC			1500000		1292625
d	DGPS Survey of bundary, borehole points (3 boreholes & 12 boundary point)	1.6.2	per point	19200	19200	15	288000
e	Borehole pillaring	2.2.7	Per bh	2000	2000	3	6000
f	Land crop compensation	5.6	Per bh	20000	20000	3	60000
g	Geological Report preparation	5.2					750000
h	Peer review			10000	10000		10000
	Miscellaneous Charges Total						**3286625**
	Total (I- Field op +II- Field work+III- Lab+ IV -Misc)						24455145
	GST (@18%)						4401926
	Grand Total						28857071
							2.88570711

Note- 1) Above rate of drilling, GPL, Chemical, are budgeted rates.

2) There are numerous items in chemical anlysis.The CIMFR rates will be applied for actual payment.

3)For Drilling the approved rates of MoC for FY 2022-23 has been considered.

4)For Geophysical logging the approved rates of MoC for FY 2020-21 has been taken other rates are as per approved SoC rates.

5) The Drilling rate for coal is Rs 6775/- is as per approved rate of Promotional exploration MoC.

6) GPL rates is Rs 566/- per meter of minimum 7 parameters, the break up is as follow

	Probe	SoC item No	Rate 2020-21 (in Rs)
1	Base Log	3.11a	162
2	Dual Density	3.11d	110
3	Natural Gamma	3.11h	96
4	Caliper	3.11g	20
5	SPR	3.11i	41
6	Resistivity	3.11c	41
7	Deviation	3.11m	96
	Total		**566**

7) Rs 10000/- for Peer review is budgeted rate.

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Time Schedule/Action Plan for West of Ghughus & Bellora Block, Wardha Valley Coalfield																	
S. No	**Activities**																**Remarks**
		Months	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1	Outsourcing	Months	<------>															3 Months
2	Mobilising	Months				↔												1 months
3	Drilling (Nos of rigs-1 rigs)	Months					<---------->											2500 in 3 Bh
4	Borehole Geophysical logging	Days					<---------->											2500 in 3 Bh
5	Survey Party days (1 Party)	Days					<---------->											30 Days
6	Geologist Party days, Field (1 Party)	Days					<---------->											120 Days
7	Geophysict Party days, Field (1 Party)	Days					<---------->											7 Days
8	Laboratory Studies (Band By Band)	Nos.						<---------->										180 sample
9	Laboratory Studies (Overall)	Nos.									<---------->							25 sample
10	Laboratory Studies (Special) & (Petrography)	Nos.												↔				5 Sample
11	Geologist Party days, HQ (1 Party)	Days												<---------->				30 Days
12	Geophysict Party days, HQ (1 Party)	Days												<---------->				7 Days
13	Report Writing & Peer Review	Months												<---------->				4 Months

Note: Please add activities accordingly and timelime (months)

Total Time Period of Completion of Project- *15 months from Sanction of Project*